

## CLAIMS

What is claimed is:

1 1. A method for manufacturing a magnetic structure on a magnetic write head,  
2 comprising:  
3 constructing a photoresist layer having a trench;  
4 depositing a magnetic material into the trench;  
5 removing the photoresist layer;  
6 depositing a dielectric material;  
7 performing a chemical mechanical polish to remove a portion of said dielectric  
8 material;

9 performing a reactive ion mill procedure to remove a sufficient amount of  
10 dielectric material to expose said magnetic material.

1 2. A method as in claim 1 further comprising forming a magnetic pole structure over  
2 the exposed magnetic material.

1 3. A method as in claim 1 wherein said constructing a photoresist trench further  
2 comprises:  
3 depositing photoresist; and  
4 performing a deep ultraviolet photolithography on the photoresist.

1    4.     A method as in claim 1, wherein said depositing said magnetic material comprises  
2     electroplating.

1    5.     A method as in claim 1, wherein said depositing said magnetic material comprises  
2     electroplating said magnetic material, and terminating said electroplating before said  
3     magnetic material reaches an upper opening in said trench formed in said photoresist  
4     layer.

6.     A method as in claim 1, wherein said trench includes a flared portion, and  
wherein said depositing said magnetic material comprises electroplating said magnetic  
material, and terminating said electroplating before said magnetic material reaches said  
flared portion formed in said trench.

1    7     A method as in claim 1, wherein said magnetic material comprises NiFe.

1    8.     A method as in claim 2, wherein said magnetic pole structure comprises NiFe.

1    9.     A method as in claim 1, wherein said reactive ion milling procedure is performed  
2     sufficiently to form a recession of between 0 and 0.3 microns between said magnetic  
3     structure and an upper surface of said alumina.

1    10.    A method as in claim 1 wherein said magnetic structure has a width sigma of less  
2     than 10 nanometers.

1 12. A method as in claim 1 wherein said trench formed in said photoresist layer has a  
2 width sigma of less than 10 nanometers up to a location where said magnetic  
3 material deposition will terminate.

1 13. A method as in claim 1 wherein said dielectric material is alumina ( $\text{Al}_2\text{O}_3$ ).

1 14. A method as in claim 1 wherein said magnetic structure is a P3 pedestal of a  
2 magnetic pole.

1 15. A method as in claim 1 wherein said reactive ion mill is performed in an  
2 atmosphere comprising  $\text{CHF}_3$ .

1 16. A method as in claim 1 wherein said reactive ion mill is performed sufficiently to  
2 create a recess between an upper surface of said magnetic structure and an upper  
3 surface of said dielectric material.

1 17. A method as in claim 1 wherein said reactive ion mill is performed sufficiently to  
2 create a recess between an upper surface of said magnetic layer and an upper surface of  
3 said dielectric layer wherein said recess is between .1 and .3 microns inclusive.

1 18. A method as in claim 1 wherein said reactive ion mill is performed sufficiently to  
2 create a recess between an upper surface of said magnetic layer and an upper surface of  
3 said dielectric layer wherein said recess is about .3 microns.

1 19. A structure formed on a magnetic write head, comprising:  
2 a magnetic structure having an upper surface and having first and second lateral  
3 sides and having a width measured between said lateral sides and having a height  
4 measured perpendicular thereto;  
5 a dielectric layer contacting said first and second lateral sides of said magnetic  
6 structure and extending laterally therefrom and having an upper surface; and  
7 wherein  
8 said upper surface of said dielectric layer is recessed from said upper surface of  
9 said magnetic structure and said upper surface of said dielectric layer.

1 20. A structure as in claim 19 wherein said recess is between .1 and .5 microns.

1 21. A structure as in claim 19 wherein said recess is about .3 microns.